

REMARKS

The claim rejections are improper because they appear to have missed certain limitations and further because the cited portions of the references do not (technically) operate in accordance with the claimed invention as asserted. In addition to this lack of correspondence, the instant application and relevant art teaches away from the proposed combination of references as proposed. Accordingly, the Final Office Action has not established teaching or suggestion of the claimed invention (or *prima facie* obviousness). The following addresses these matters in greater detail.

The Final Office Action dated January 23, 2009 notes the following rejections: claims 1-10, 18-27 and 33 stand rejected under 35 U.S.C. § 103(a) over Berberidis (U.S. Patent No. 6,052,702) in view of Crespo (U.S. Patent No. 5,020,078); claims 11 and 28 stand rejected under 35 U.S.C. § 103(a) over the '702 and '078 references in view of Johnson (U.S. Patent No. 5,808,574); claim 12 stands rejected under 35 U.S.C. § 103(a) over the '702 and '078 references in view of Gay-Bellile (U.S. Patent Pub. 2002/0070796); and claim 17 stands rejected under 35 U.S.C. § 103(a) over the '702 and '796 references in view of Thomas (U.S. Patent Pub. 2004/0013084). Applicant respectfully traverses all claim rejections, and further does not acquiesce to any averment made in the Office Actions of record, unless Applicant explicitly states otherwise.

The § 103 rejections are improper because the Final Office Action has failed to provide correspondence to multiple claim limitations and has not provided an explanation as to how the cited components could or would operate as claimed (*i.e.*, the respective cited portions do not operate as in the claimed invention). For instance, various rejections rely upon citations to circuit components bearing similar names or operating in similar fields as those in the claimed invention, yet the cited components do not operate in accordance with the claim limitations. As the Final Office Action generally repeats the rejections from the prior Action, and as the "Response to Arguments" section fails to address this lack of correspondence in a manner that explains how the cited portions (technically) correspond, Applicant maintains and fully incorporates the traversals as presented in the response filed on October 27, 2008. The following discussion highlights the lack of correspondence between the cited combination of references and selected claims.

Regarding the rejection of claim 33 as added in Applicant's previous response, it appears that the Final Office Action has missed several limitations. For example, the disparately-cited portions of the '702 reference make no mention of limitations including those directed to performing a feed forward equalization using "a fast Fourier transformation estimation of a channel impulse response of an output single carrier signal." None of the cited portions of the '702 reference mention any impulse response, and the cited Fourier transform is carried out upon a multi-carrier signal rather than a single-carrier signal. Applicant has reviewed the entire '702 reference and cannot ascertain any disclosure of the claimed estimation of a channel impulse response, or any mention of "impulse" whatsoever. The rejection of claim 33 has accordingly failed to cite any correspondence to the claimed equalization and estimation of a channel impulse response. Moreover, as consistent with Applicant's traversals of record, the '702 reference simply fails to disclose using a single carrier signal, and the Final Office Action fails to explain how the cited multiplexer would operate upon such a single carrier signal.

Further regarding claim 33 and as relevant to claims 2 and 19, the cited references do not disclose limitations directed to "multiplying each of the components of said second vector of signals with the generated equalization parameters to reduce the signal-to-noise ratio of the signals." The cited portions of the '702 reference do not mention any signal-to-noise ratio or reduction of the same. As discussed in Applicant's prior response in connection with claims 2 and 19, the Office Action appears to have equated intersymbol interference with noise, without providing any explanation for the same. The Response to Arguments again ignores this lack of correspondence, and instead of addressing the technical differences in the cited reference, simply states that "Col. 3 lines 5-9 shows a clear explanation for the application of the cited disclosure of the prior art towards the limitations of the claims as currently provided." However, this cited portion of column 3 indicates that "outputs $y(n)$ are noise-sensitive," and aside from mentioning the term "noise," has no bearing whatsoever upon the claimed reduction of a signal-to-noise ratio, using equalization parameters generated using an impulse response estimation or otherwise. Applicant's traversals pointing out the technical differences in the cited reference have therefore gone unaddressed in a manner that is contrary to M.P.E.P. § 707.07(f). Applicant has again reviewed the entire '702 reference and cannot ascertain

any mention of a signal-to-noise ratio, of reducing such a ratio, or of multiplying a second vector with parameters generated using an impulse response estimation as discussed above.

Regarding the rejection of claims 1 and 18, the cited “subtractor 22” does not correspond to the claimed adding means because it does not add “the output signal of said feedback filter means to the output signal of said first section.” The discussion in the Response to Arguments section amounts to an assertion that a subtracter as known in the art can be made to add values (rather than subtract) by adjusting the sign of the respective values. While Applicant does not dispute that adders and subtracters can be used as asserted, this does not overcome the fact that the cited “subtractor 22” in the ‘078 reference simply does not combine “the output signal of said feedback filter means to the output signal of said first section” as claimed. As previously discussed, the “subtractor 22” circuit subtracts estimated distortion samples from input symbols (*see, e.g.*, column 3:59-4:2), and thus fails to teach or suggest the aforesaid limitations. Thus, whether termed an “adder” or a “subtractor,” the cited subtracter 22 simply does not correspond to the claimed invention as asserted.

Further regarding the rejection of claims 1 and 18, the Office Action’s citation to a multiplexer 12 as allegedly corresponding to a single-carrier equalization means as claimed fails to provide any explanation as to how the cited multiplexer 12 would perform “feed forward equalization by multiplying each of the components of said second vector of signals with equalization parameters, and outputting a third vector of signals.” The multiplexer 12 performs no such equalization, and instead operates upon a multi-carrier signal by multiplying the signal by weighting coefficients. Applicant has reviewed the ‘702 reference and cannot ascertain any discussion of equalization, of equalization parameters, or as to how the cited multiplexer 12’s multiplication of weighting coefficients to a multi-carrier signal would correspond to the claimed equalization of a single-carrier signal.

Regarding the rejection of claims 3 and 20, the cited portions of the ‘078 reference simply mention “channel impulse” and do not disclose, teach or suggest the claimed equalization means and its functions relating to using a “fast Fourier transformation estimation of a channel impulse response” to generate equalization

parameters. The Response to Arguments fails to further address these matters, in simply referring back to these cited portions while failing to provide any technical explanation (thus again failing to address Applicant's traversals pointing out the technical differences in the cited reference, contrary to the requirements of M.P.E.P. § 707.07(f)).

Regarding the rejection of claims 4 and 21, the cited "M/PL element" acts after the forward filter FF and thus does not disclose limitations directed to "for converting a sequence of signals inputted into said first section to said first vector of signals." That is, since the M/PL element acts *after* the forward filter as cited, it cannot convert a sequence of signals "inputted" as claimed. This is consistent with Applicant's traversals of record, which detailed this claim language (contrary to the assertions in the Response to Arguments section of the Final Office Action, which again fails to address Applicant's traversals in a manner as required under M.P.E.P. § 707.07(f)). Correspondingly, the rejections of claims 4 and 21 as well as claims 5-8 and 22-25, which depend from either claim 4 or 21, are improper.

Regarding the § 103 rejection of claims 11 and 28, the Office Action has not asserted that either reference teaches providing an output signal built by consecutive blocks, where each block includes "a pseudo noise sequence" and "a predetermined number (M) of samples from" an output signal as claimed. The cited portions of column 6:36-45 discuss partitioning blocks into sub-blocks but do not disclose blocks that include a pseudo noise sequence or a predetermined number of samples. Furthermore, the size of the sub-blocks is set at a "size L with L as an integer such that $L=M/P$, with P as an integer" and thus do not appear to be relevant to any number of samples. Accordingly, the cited portions of column 6 do not "fully encompass the claimed limitation" as asserted. In addition, while the secondary '574 reference describes a pseudo-random noise generator, it does not disclose including a pseudo noise sequence with blocks of an output signal as claimed, and the Office Action has provided no explanation as to how the cited noise generator could or would function in accordance with the claimed invention. The Response to Arguments section of the Final Office Action again points to the previously-cited portions of the respective references but adds no explanation whatsoever as to how these cited portions establish teaching or suggestion of the claimed invention (*i.e.*, there is no *prima facie* case of obviousness). In contrast to M.P.E.P. § 707.07(f), the

Final Office Action has again failed to address Applicant's traversals that specifically point out limitations that are not disclosed (or even mentioned) in the cited references.

Applicant further notes that none of the proposed combinations involving the '702 reference can be applied to the claimed invention under §103(a) because the '702 reference (in its multi-carrier approach) teaches away from the single-carrier approach in the claimed invention. As consistent with M.P.E.P. § 2143.01, the Supreme Court has looked favorably upon such teaching away in stating, "when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be non-obvious" (*KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1742 (2007)). The Court further tied in the relationship between the teach-away standard and demonstrating unpredictable results. "The fact that the elements [in *Adams*] worked together in an unexpected and fruitful manner supported the conclusion that Adam's design was not obvious to those skilled in the art."

In this instance, paragraphs 0008-0013 of Applicant's specification explain that there are various problems with multi-carrier applications (*e.g.*, involving orthogonal frequency division multiplexing (OFDM)). This is also consistent with various technical treatises and other sources, as readily available in the art. Applicant's specification goes on to explain at paragraph 0017 that the obtained results overcome the "drawbacks of the single carrier modulation while essentially keeping the above mentioned advantages of single carrier modulation" (over multi-carrier modulation such as OFDM). Paragraph 0034 of Applicant's disclosure further describes results in the provided "solution for the problem of peak on average power ratio, which problem is typical for OFDM systems with even an improved performance over conventional single carrier modulation architectures. As Applicant's claimed invention not only solves the problems relevant to the cited multi-carrier modulation, but also presents a solution with surprising results for different attributes, Applicant believes that the claimed invention is not suggested by the '702 reference and the proposed combinations therewith. With the asserted '702 reference teaching a process that causes these noted problems, the '702 reference teaches away from the asserted combination of references.

The proposed modification of the '702 reference is also improper because it would remove its purpose as directed to the use of a multiplexer (*e.g.*, 12 in FIG. 4) to

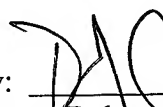
process and weight a multipath digital signal (*see, e.g.*, M.P.E.P. § 2143.01 and *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984) (A §103 rejection cannot be maintained when the asserted modification undermines purpose of the main reference.)) As indicated at paragraph 0008 of the instant application and discussed above, this multipath approach is inconsistent with and fails to correspond to the claimed single carrier modulation, and cannot operate to correspond to the same. This is also consistent with various technical treatises and other sources, as readily available in the art. The Final Office Action has not directly addressed these matters regarding the impropriety of modifying the '702 reference to remove its multi-carrier aspects, in responding only that the cited references are "both in relation to decision feedback equalizers." This response fails to address the issue at hand, namely that the proposed modification would undermine the purpose of the '702 reference. There is thus no motivation to modify the '702 reference and accordingly no *prima facie* case of obviousness.

In view of the remarks above, Applicant believes that each of the rejections has been overcome and the application is in condition for allowance. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is asked to contact the agent overseeing the application file, Peter Zawilski, of NXP Corporation at (408) 474-9063.

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